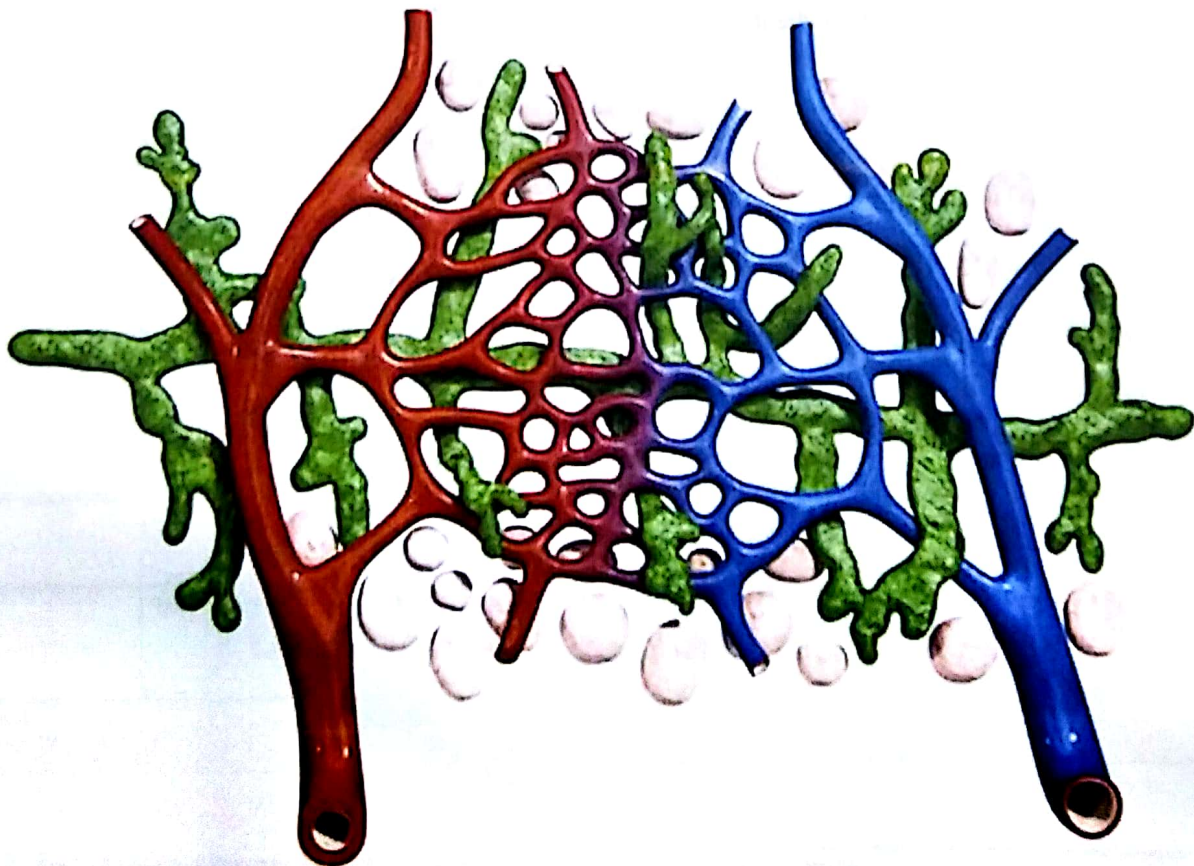


Easy Pathology

— Dr. Abdelrahman Khalifa —

Blood & Lymph



2017-2018

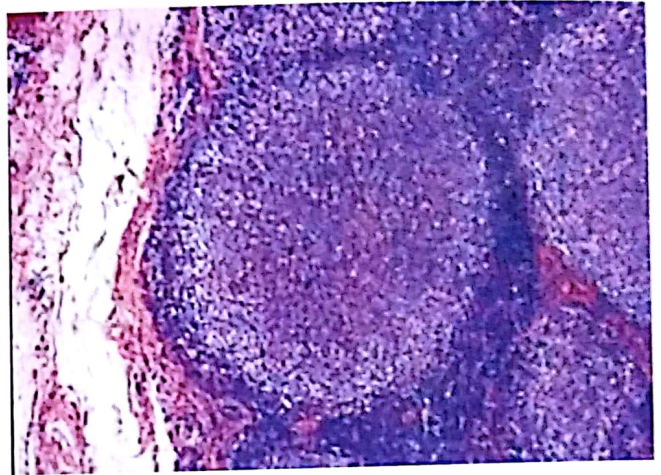
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Sites of lymphoid tissue: L.N., Spleen, Thymus, B.M., Intestine, & Tonsils.

Structure of Lymph node

- **Capsule** (Fibrous tissue)
- **Cortex** , containing Lymphoid follicles:
 - **Marginal zone** : B-cells
 - **Mantle zone**: B-cells (tightly packed)
 - **Pale Germinal center** :
 - Small cleaved B centrocytes
 - Large B centroblasts
 - Macrophage & dendritic cells
- **Paracortex** : T-cells , Immunoblasts (activated T & B) , Reticulum cells
- **Medulla**: Lymph sinuses , vessels , Plasma cells , Plasmacytoid B-cells



Lymphoma

	Hodgkin's	Non Hodgkin's
Incidence	Less common	More common
Sites	Nodal (Single or multiple) Extranodal (less common)	Nodal (Mostly multiple L.N.s) <u>extranodal</u> (More common)
Distribution	More mono-nodal (more in cervical)	More Multi-nodal (more than one group)
Gross	Large – Grayish pink - Firm	Large – Pale Grey – Soft (Fish flesh)
Microscopic	-effacement of L.N. architecture -Background: <u>mixed inflammatory</u> cells -Malignant Reed-Sternberg (RS) cells	- effacement of L.N. architecture -Background: <u>malignant lymphocytes</u> (B or T) - <u>NO</u> R-S cells
Immune-staining	RS is positive to CD15 , & CD 30	Malignant lymphocytes are positive to CD3 (T cells) , CD20 (B cells)
Clinical	Intermittent Fever (Pel-Ebstein fever)– Cachexia – Anemia - itching	No 2ry B-symptoms
Prognosis	Better	worse

Reed-Sternberg cells (R-S) of Hodgkin Lymphoma

- **Classic** Large – Pale eosinophilic – 2 Kidney-shaped nuclei, mirror image – eosinophilic nucleoli surrounded by clear zone (Owl eye)
- **Pleomorphic** Irregular single nucleus
- **Lacunar** single or multilobed nucleus – retracted cytoplasm
- **Mononuclear** Single nucleus – eosinophilic nucleolus
- **Pop corn Lymphocyte predominant** multilobed nucleus (pop-corn) - multiple nucleoli – scanty cytoplasm

Types of Hodgkin's Lymphoma

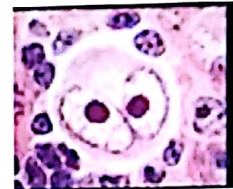
- Nodular Sclerosis

- The most common , more in females
- Background : Lymphocytes & mixed inflammatory cells, bands of collagen
- RS: **Lacunar** RS cells
- The best prognosis (arrest in Stage **I or II**)



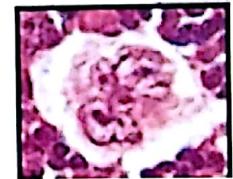
- Mixed cellularity

- The 2nd most common, more in older ages
- Background : Mixture of different inflammatory cells
- RS: **Classic RS** cells - Fair prognosis (arrest in stage **III**)



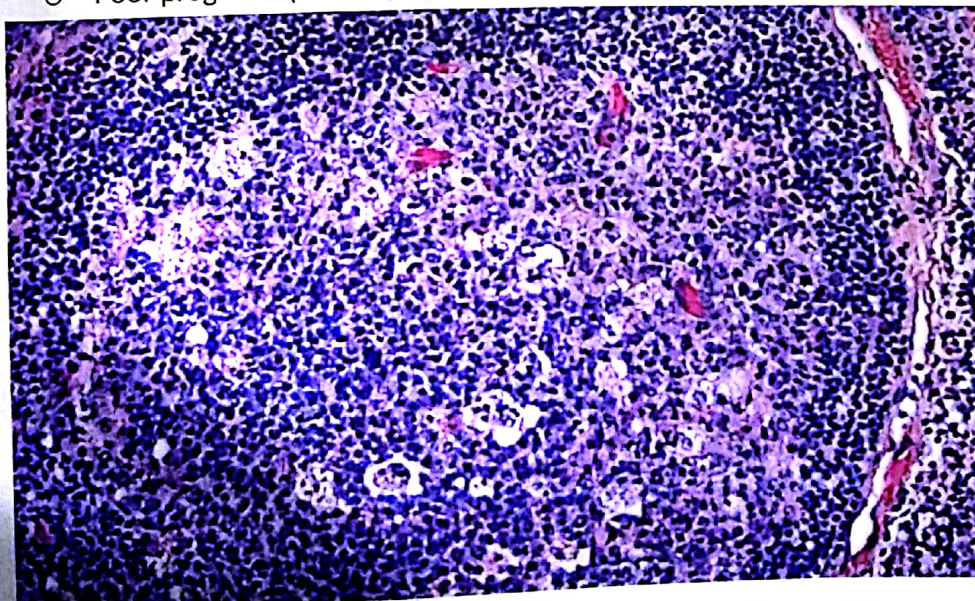
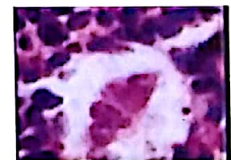
- Lymphocyte Predominant

- Uncommon
- Background Excess normal lymphocytes
- RS: rare classic RS, frequent **Popcorn**
- Good prognosis (arrest in Stage **I or II**)



- Lymphocyte depletion

- Uncommon
- Background : Few lymphocytes , fibrosis could be found
- RS: Excess **Pleomorphic RS**
- Poor prognosis (**III or IV**)



Staging of Hodgkin

Stage I : One LN group , or single extranodal organ (IE)

Stage II: More than one group at the same side of diaphragm alone or with limited extranodal site (IIe)

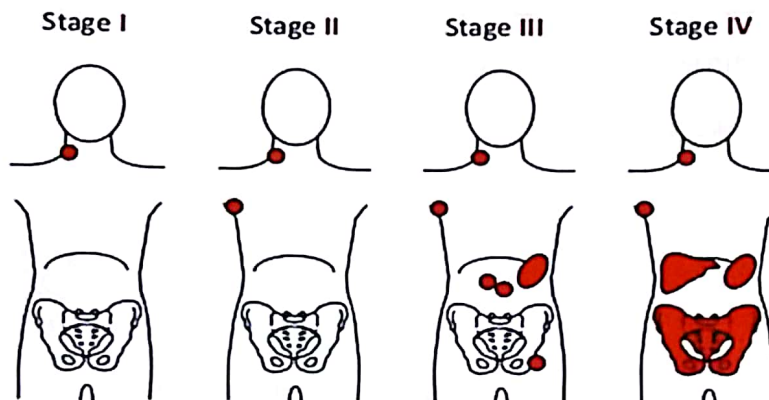
Stage III: More than one group on both sides of diaphragm

IIIs :with Splenic lymphoma

IIIe : with Limited extra nodal

IIIs: both

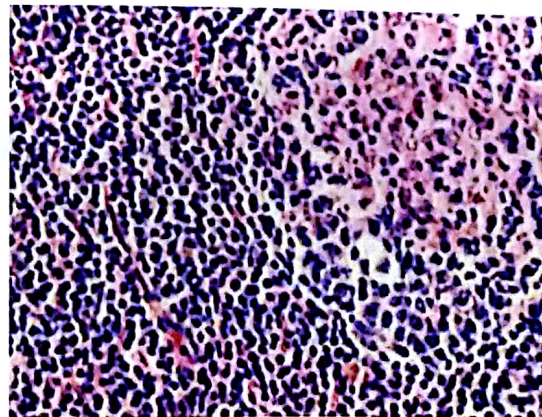
Stage IV: Multiple disseminated Extranodal involvement



Non-Hodgkin's Lymphoma

B-cell lymphoma

- B-cell precursor B-cell Leukemia/Lymphoma (Lymphoblastic)
- Mature B-cell lymphoma
 - Small Lymphocytic
 - Follicular lymphoma
 - Marginal zone B-cell lymphoma (Nodal or MALT)
 - Mantle cell lymphoma
 - Lymphoplasmacytic
 - Diffuse large B-cell
 - Burkitt's



	Origin	Microscopic	Prognosis/ Fate
Lymphoblastic	Bone marrow (B) Thymus (T)	Lymphoblasts in LN & peripheral blood	May associate with Leukemia in Children
Small Lymphocytic	<u>Marginal</u>	Diffuse uniform small cells . Variable number of <u>large activated cells</u>	Good (low grade)
Follicular	Follicular	Follicles of malignant centrocytes & centroblasts -Follicular small cell (more centrocytes) -Follicular Large (more centroblasts) -Follicular mixed	According to predominance of <u>centroblasts</u> → increase the grade (generally Good)
Marginal	Marginal	Variable cells Sites: more extranodal MALT of GIT	Good (low grade)
Mantle	Mantle	Diffuse <u>small cells, intermediate cells</u>	Good (low grade)
Lympho-plasmacytic	---	Cells with <u>Plasmacytoid</u> differentiation	Secretes Ig → blood viscosity (Waldenstrom Macroglobulinemia)
Diffuse Large B (the most common 40-50%)	<u>Marginal</u> , <u>Follicular</u>	Large malignant lymphocytes with large <u>nucleus</u> & prominent <u>nucleoli</u>	Bad
Burkitt's	<u>Follicular</u> caused by EBV common in children	" Starry Sky appearance " -Uniform lymphocytes (dense cytoplasm, lipid vacuoles, single nucleus, multineucleoli 2-5) -frequent mitoses -Pale macrophage (phagocytosis of apoptotic lymphocytes)	Bad sites: African: maxilla & mandible Western: terminal ileum, ovaries, kidney

T-cell Lymphoma

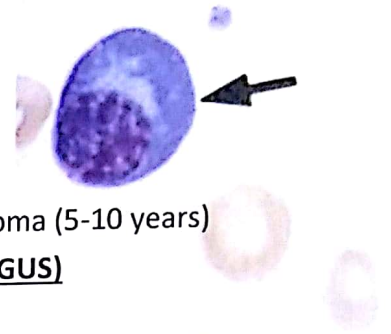
- T-cell precursor
 - T-cell Leukemia/Lymphoma (Lymphoblastic lymphoma)
- Mature T-cell lymphoma MAP
 - Mycosis fungoides
 - Site : Skin
 - Gross: Erythematous rash
 - Micro: Malignant T cells in epidermis & upper dermis
 - **Anaplastic large cell** Aggressive & high grade
 - **Peripheral T-cell lymphoma**
 - The most common T lymphoma in Adults, Aggressive



C/P of Non Hodgkin Lymphoma: L.N. enlargement (localized or generalized) , Loss of weigh, Anemia, & pressure symptoms

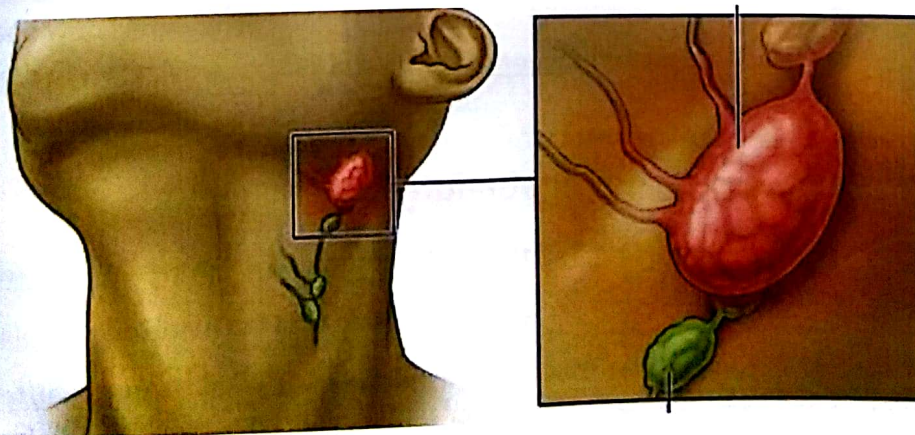
Plasma cell tumors

- Multiple myeloma
- Solitary Plasmacytoma
 - **Soft tissue type** → spread (cured surgically)
 - **Skeleton type** → Slow progression to Multiple myeloma (5-10 years)
- Monoclonal gammopathy of undetermined significance (MGUS)
 - Elevated **M protein** in serum.
 - May progress to Multiple myeloma



Causes Lymph node enlargement

- Acute **VITAL**
 - Viral vaccine
 - IMN
 - Typhoid
 - Acute bubonic plague
 - Lymphadenitis (e.g. suppurative)
- Chronic
 - **Chronic Lymphadenitis** (Specific – Non specific) ..enumerate?
 - **AIDS-related Lymphadenopathy**
 - **Malignancy**
 - Lymphoma
 - Chronic Leukemia
 - Metastatic tumors



Lymphadenitis

Acute – Chronic – IMN

Acute Lymphadenitis

Causes: Draining are of acute inflammation, e.g. **Abscess**

Morphology: Large – tender – acute inflammation (e.g. suppuration)

Cronic non-specefic Lymphadenitis

1. **Reactive Follicular hyperplasia**

activated B → prominent follicles , prominent germinal centers

causes : **Infections** (eg.HIV, Toxoplasma) **Immune** (Rheumatoid)

2. **Paracortical hyperplasia**

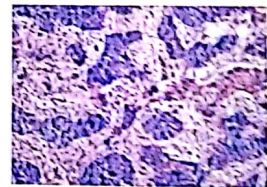
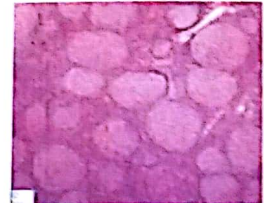
activated parafollicular T-cells

causes: **Viral** (EBV) – **Viral Vaccination** – **Drugs** (e.g.Phenytoin)

3. **Sinus histiocytosis**

activated histocytes

cause: nearby **cancer** (*drainage of tumor products*)



Granulomatous Lymphadenitis

T.B., Sarcoidosis, Txoplasmosis, Crohn's disease, & cat-scratch disease

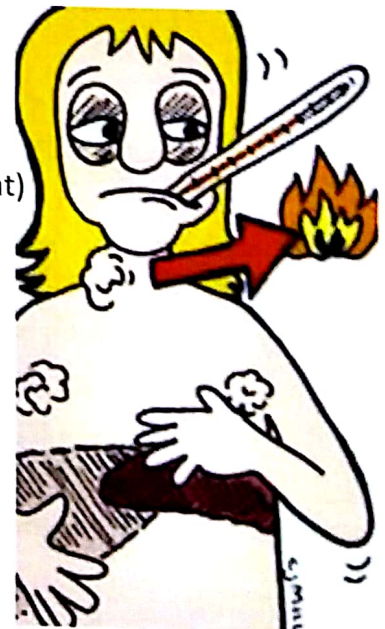
Infectious Mononucleosis

Aetiology: EBV

Gross: Lymphadenopathy , splenomegally, Acute pharyngitis (sore throat)

Micro: **Atypical B-cells** in Paracortex , Architecture is partially lost (confused with lymphoma)

Diagnosis: **Atypical** lymphocytes in blood , Monospot test , EBV Ab



T.B. Lymphadenitis

Common sites : Cervical – Mediastinal – Mesentric

Morphology:discussed in general pathology

Complications: Spread (Direct , Hematogenous) , Calcification, 2ry Amylodosis

-Cervical → **Cold abscess** & Skin sinuses → Skin TB

-Mediastinal→ Pressure , & spread to other lung

-Mesenteric→ TB peritonitis



Cat Scratch disease

Aetiology: *Coccobacilli*, through skin scratches (Cat, rabbit)

Gross: Large axillary L.N.

Micro: *Microabscesses*: Stellate area of necrosis & neutrophils surrounded by histocytes (*stellate necrotizing granuloma*)



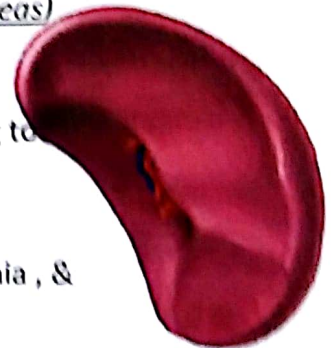
Diseases of Spleen

Congenital

- **Asplenia** (rare & associated with congenital Heart dis)
- **Accessory spleen** (more common, mainly present at tail of pancreas)

Hypersplenism: Exaggerated **function** of splenic macrophages leading to destruction of one or more of blood cellular components.

- **1ry:** Unknown cause, may lead to 1ry thrombocytopenia
- **2ry:** to other diseases (e.g. CVC, Bilharziasis, Lymphoma, Leukemia, & myelosclerosis)



CVC of spleen: Part of systemic venous congestion – Liver fibrosis & cirrhosis – Thrombosis of portal or Splenic veins

Morphology: discussed in general pathology

Splenomegaly

CHINA



- **CVC:** (enumerate causes?)
- **Hematological diseases** (Hemolytic anemia, Thrombocytopenic purpura)
- **Infections & Immunological**
 - **Bacterial**: bacteremia, septicemia, Typhoid, T.B., Syphilis
 - **Viral**: IMN
 - **Parasite**: Bilharziasis, Toxoplasma, Hydatid, Kala azar, Malaria
 - **Autoimmune**: SLE, Rheumatoid arthritis
- **Neoplastic**: Lymphoma, Leukemia, Lymphangioma, Metastasis
- **Accumulations & storage diseases**
 - **Amyloidosis**
 - **Metabolic**: Glycogen storage, Niemann-Pick & Gaucher's